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IS 3924 (1980): Benzyl Alcohol [PCD 18: Natural and Synthetic Fragrance Materials]



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IS : 3924 - 1980

*Indian Standard*  
SPECIFICATION FOR BENZYL ALCOHOL  
(*First Revision*)

UDC 547.568.1 : 665.52/.54



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MANAK BHAVAN, 9 BAHADUR SHAH ZAFAR MARG  
NEW DELHI 110002

*November 1980*

**AMENDMENT NO. 1   MAY 1992**  
**TO**  
**IS 3924 : 1980 SPECIFICATION FOR BENZYL**  
**ALCOHOL**

*( First Revision )*

*( Page 3, clause 0.3, line 6 ) — Substitute 'as the main method' for 'for guidance'.*

**( PCD 18 )**

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**Reprography Unit, BIS, New Delhi, India**

# *Indian Standard*

## SPECIFICATION FOR BENZYL ALCOHOL

### ( *First Revision* )

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*Indian Standard*  
**SPECIFICATION FOR BENZYL ALCOHOL**  
*( First Revision )*

**0. FOREWORD**

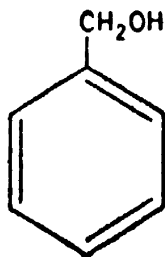
**0.1** This Indian Standard ( First Revision ) was adopted by the Indian Standards Institution on 20 June 1980, after the draft finalized by the Natural and Synthetic Perfumery Materials Sectional Committee had been approved by the Petroleum, Coal and Related Products Division Council.

**0.2** This standard was first published in 1966. The Sectional Committee responsible for the preparation of this standard felt that it should be revised in view of trade practices in perfumery industry and to suit the material currently being manufactured and sold in the country.

**0.3** Two grades namely, Grade 1 ( Pharmacopoeial ) and Grade 2 ( Perfumery ) were covered in the original standard. Since there was not much difference in the requirement for these grades, the sectional committee decided to delete the reference to grades in this revision. Also gas chromatography method for determination of purity of compound, which is progressively used in the country has been included for guidance. Furthermore, separate standards on ' Methods of sampling and test for natural and synthetic perfumery materials ' have been prepared for each method of test and references have been made accordingly.

**0.4** Benzyl alcohol (  $C_7H_8O$  ) and its esters are found in the essential oils of a wide variety of flowers and in balsams obtained from the exudation of trunks of resinous trees. Benzyl alcohol is one of the few chemicals used extensively not only in perfumery but in totally unrelated fields as well, such as pharmaceuticals, lacquers, etc. Large quantities of benzyl alcohol are therefore manufactured of which only a portion is used in the perfumery industry.

**0.4.1** Benzyl alcohol has a somewhat weak odour and its main use is as a solvent in perfumes and pharmaceuticals. It is represented by the following structural formula:



BENZYL ALCOHOL  
( Molecular Mass 108.14 )



**0.5** In the preparation of this standard, considerable assistance has been derived from 'the Givaudan Index, 1978', published by Givaudan-Delawanna Inc, New York.

**0.6** For the purpose of deciding whether a particular requirement of this standard is complied with, the final value, observed or calculated, expressing the result of a test or analysis, shall be rounded off in accordance with IS : 2-1960\*. The number of significant places retained in the rounded off value should be the same as that of the specified value in this standard.

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## **1. SCOPE**

**1.1** This standard prescribes the requirements and the methods of sampling and test for benzyl alcohol used as a solvent in perfumery industry.

## **2. TERMINOLOGY**

**2.1** For the purpose of this standard, the definitions given in IS : 6597-1972† shall apply.

## **3. REQUIREMENTS**

### **3.1 Description**

**3.1.1** The material shall generally be obtained by hydrolysis of benzyl chloride.

**3.1.2** The material shall be a colourless liquid free from sediment, suspended matter and adulterants.

**3.1.3** The material shall be examined for its colour, clarity, suspended matter and sediment as prescribed in IS : 326 ( Part II )-1980‡.

### **3.2 Solubility**

**3.2.1** *In Ethanol* — The material shall be clearly soluble in 1.5 volumes of ethanol ( 50 percent *v/v* ), when tested as prescribed under 8 of IS : 326-1968§.

**3.2.2** *In Water* — One part of the material shall also be soluble in 30 parts of water ( by volume ) at 27°C.

\*Rules for rounding off numerical values ( *revised* ).

†Glossary of terms relating to natural and synthetic perfumery materials.

‡Methods of sampling and test for natural and synthetic perfumery materials: Part II Preliminary examination of perfumery materials and samples ( *second revision* ).

§Methods of sampling and test for natural and synthetic perfumery materials ( *first revision* ).

**3.3** The material shall be tested olfactorily and especially for by-notes as prescribed under 4 and 5 of IS:2284-1963\*.

**3.4** The material shall also comply with the requirements given in Table 1.

**TABLE 1 REQUIREMENTS FOR BENZYL ALCOHOL**

( Clauses 3.4 and 6.1 )

| Sl. No. | CHARACTERISTIC                           | REQUIREMENT        | METHOD OF TEST, REF TO                        |
|---------|--|--------------------|---|
| (1)     | (2)                                      | (3)                | (4)   |
| i)      | Odour                                    | Faintly aromatic   | Cl 4 & 5 of IS : 2284-1963*                   |
| ii)     | Relative density at 27°C/<br>27°C        | 1.036 to 1.040     | IS : 326 ( Part III )-1980†                   |
| iii)    | Refractive index at 27°C                 | 1.535 8 to 1.537 8 | Cl 7 of IS : 326-1968‡                        |
| iv)     | Acid value, Max                          | 0.3                | IS : 326 ( Part VII )-1980†                   |
| v)      | Alcohol content, percent<br>by mass, Min | 99                 | Appendix A and Cl 11.4.3 of<br>IS : 326-1968‡ |
| vi)     | Freedom from chlorinated<br>compounds    | To pass test       | Appendix B                                    |

\*Method for olfactory assessment of natural and synthetic perfumery materials.

†Methods of sampling and test for natural and synthetic perfumery materials  
( second revision ):

Part III Relative density.

Part VII Determination of acid value.

‡Methods of sampling and test for natural and synthetic perfumery materials  
( first revision ).

## 4. PACKING AND MARKING

**4.1 Packing** — The material shall be supplied in glass bottles, or in suitable containers as agreed between the purchaser and the supplier. Aluminium containers shall be avoided. The containers shall be tightly closed and nearly full.

**4.2 Marking** — Each container so filled shall bear legibly and indelibly the following information:

- Name of the material;
- Name of the manufacturer and his recognized trade-mark, if any;
- Batch number and date of manufacture; and
- Net and gross mass.

\*Method for olfactory assessment of natural and synthetic perfumery materials.

**4.2.1** The containers may also be marked with the ISI Certification Mark.

**NOTE** — The use of the ISI Certification Mark is governed by the provisions of the Indian Standards Institution ( Certification Marks ) Act and the Rules and Regulations made thereunder. The ISI Mark on products covered by an Indian Standard conveys the assurance that they have been produced to comply with the requirements of that standard under a well-defined system of inspection, testing and quality control which is devised and supervised by ISI and operated by the producer. ISI marked products are also continuously checked by ISI for conformity to that standard as a further safeguard. Details of conditions under which a licence for the use of the ISI Certification Mark may be granted to manufacturers or processors, may be obtained from the Indian Standards Institution.

## **5. SAMPLING**

**5.1** Representative samples of the material, each sample containing not less than 50 ml shall be drawn as prescribed under 3 of IS: 326-1968\*.

## **6. TEST METHODS**

**6.1** Tests shall be conducted as prescribed in IS: 326-1968\*, IS: 2284-1963† and in Appendices A and B. References to relevant parts and clauses of these standards and appendices and clauses are given in col 4 of Table 1.

**6.2 Quality of Reagents** — Unless specified otherwise, pure chemicals and distilled water ( *see* IS: 1070-1977‡ ) shall be employed in tests.

**NOTE** — ' Pure chemicals ' shall mean chemicals that do not contain impurities which affect the results of analysis.

# **A P P E N D I X   A**

[ *Table 1, Item (v)* ]

## **GAS CHROMATOGRAPHIC ANALYSIS OF BENZYL ALCOHOL**

### **A-0. GENERAL**

**A-0.1** The chromatographic conditions given here are for guidance only.

**A-0.2 Outline of the Method** — A sample of the material is injected into the gas chromatograph where it is carried by the carrier gas from one end of the column to the other. During its movement the constituents

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\*Methods of sampling and test for natural and synthetic perfumery materials ( *first revision* ).

†Method for olfactory assessment of natural and synthetic perfumery materials.

‡Specification for water for general laboratory use ( *second revision* ).

of the sample undergo distribution at different rates and ultimately get separated from one another. The separated constituents emerge from the end of the column one after another and are detected by suitable means whose response is related to the amount of a specific component leaving the column.

## A-1. APPARATUS

**A-1.1** Any gas chromatograph capable of being operated under conditions suitable for resolving the individual constituents into distinct peaks may be used.

A typical chromatogram using such a chromatograph is shown in Fig. 1 with the following chromatographic conditions:

|                                   |   |
|-----------------------------------|---|
| <i>Sample</i>                     | Benzyl alcohol  |
| <i>Column</i>                     | Carbowax 20 M, 10 percent by mass in Chromosorb W, 250-micron IS Sieve size |
| <i>Length</i>                     | 5.486 m   |
| <i>Column temperature</i>         | 180°C   |
| <i>Injection port temperature</i> | 200°C   |
| <i>Detector</i>                   | FID or Thermal conductivity of temperature 300°C                            |
| <i>Carrier gas</i>                | Hydrogen with flow of 40 ml per minute                                      |
| <i>Chart speed</i>                | 6.35 mm per minute  |
| <i>Attenuation</i>                | 4   |

## A-2. PROCEDURE

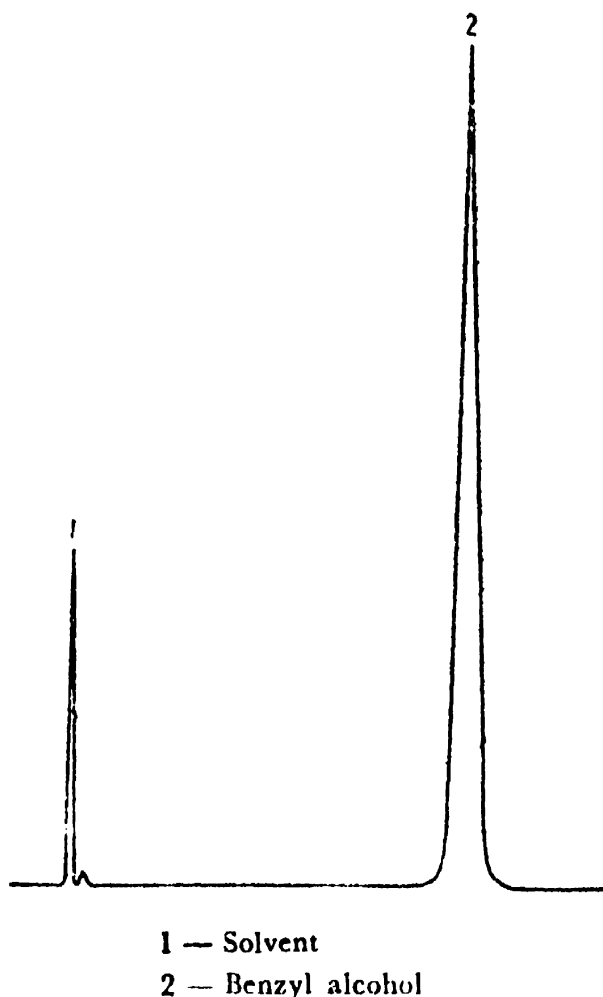
**A-2.1** Conduct the flow of the carrier gas and inject sample at injection port where it is vapourized and well mixed with carrier gas. This is led into the chromatographic column. The constituents of the sample are separated out by virtue of their differing interaction with the stationary phase. For this separation to be efficient, it is necessary that the column is maintained at the temperature suggested throughout the time required for the resolution of the constituents. As the sample enters the detector, it gives the signal corresponding to the amount of particular constituent leaving the column. The detector signals on transmission to the recorder, plots the chart. From the specific area under various peaks corresponding to specific constituents, the quantities of different constituents are determined.

## A-3. CALCULATION

**A-3.1** Calculate, from the peak areas of individual constituents shown on the chromatogram of the material concentrations of constituents

**IS : 3924 - 1980**

on the basis of peak areas on chromatograms obtained with known amount of pure constituents using the same apparatus under identical conditions.



**FIG. 1 TYPICAL CHROMATOGRAM OF BENZYL ALCOHOL**

## **A P P E N D I X B**

*[ Table 1, Item (vi) ]*

### **TEST FOR FREEDOM FROM CHLORINATED COMPOUNDS**

#### **B-0. GENERAL**

**B-0.1 Outline of the Method** — Absence of even a transient green colour, when the material is ignited on a copper gauze in a non-luminous flame is used for determining freedom from chlorinated compounds.

## **B-1. APPARATUS**

**B-1.1 Copper Wire** — bent at one end to which a strip of 850-micron copper gauze 1.5 cm wide and 5 cm long is attached.

**B-1.2 Dropper**

**B-1.3 Bunsen Burner** — capable of giving good non-luminous flame.

## **B-2. PROCEDURE**

**B-2.1** Place the copper strip in the non-luminous flame of the Bunsen burner until it glows without imparting a green colour. Cool the gauze and repeatedly ignite it until an oxide coating has formed. Cool the gauze and add 2 drops of the sample by means of a dropper, permitting it to burn in the air. Again cool and add 2 more drops of the test material and burn as before. Continue the procedure until 6 drops have been ignited. Hold the gauze in the outer edge of the non-luminous flame whose height has been adjusted to about 4 cm.

**B-2.1.1** The flame shall be free of even a transient green colour.

## INTERNATIONAL SYSTEM OF UNITS ( SI UNITS )

### Base Units

| QUANTITY                  | UNIT     | SYMBOL |
|---------------------------|----------|--------|
| Length                    | metre    | m      |
| Mass                      | kilogram | kg     |
| Time                      | second   | s      |
| Electric current          | ampere   | A      |
| Thermodynamic temperature | kelvin   | K      |
| Luminous intensity        | candela  | cd     |
| Amount of substance       | mole     | mol    |

### Supplementary Units

| QUANTITY    | UNIT      | SYMBOL |
|-------------|-----------|--------|
| Plane angle | radian    | rad    |
| Solid angle | steradian | sr     |

### Derived Units

| QUANTITY             | UNIT    | SYMBOL | DEFINITION                      |
|----------------------|---------|--------|---------------------------------|
| Force                | newton  | N      | 1 N = 1 kg.m/s <sup>2</sup>     |
| Energy               | joule   | J      | 1 J = 1 N.m                     |
| Power                | watt    | W      | 1 W = 1 J/s                     |
| Flux                 | weber   | Wb     | 1 Wb = 1 V.s                    |
| Flux density         | tesla   | T      | 1 T = 1 Wb/m <sup>2</sup>       |
| Frequency            | hertz   | Hz     | 1 Hz = 1 c/s (s <sup>-1</sup> ) |
| Electric conductance | siemens | S      | 1 S = 1 A/V                     |
| Electromotive force  | volt    | V      | 1 V = 1 W/A                     |
| Pressure, stress     | pascal  | Pa     | 1 Pa = 1 N/m <sup>2</sup>       |

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